

WHAT IS CLAIMED IS:

1. A system having diamond-like carbon (DLC) contact surfaces, comprising a pair of relatively movable, facing  
5 DLC contact surfaces at least one of which is coated with a DLC film, and a lubricant (L) interposed between said DLC contact surfaces, said lubricant (L) comprising a lubricant base oil (A) containing a below-mentioned base oil (X) as a main component, and a sulfur-containing molybdenum  
10 complex (B).

Said base oil (X) consists at least one of a hydrocracked mineral oil, a wax-isomerized mineral oil, and a poly- $\alpha$ -olefin base oil, and has a kinematic viscosity of 2 to 20 mm<sup>2</sup>/s at 100 °C, a total aromatic content of not  
15 higher than 5 mass%, and a total sulfur content of not higher than 0.005 mass%.

2. The system according to claim 1, wherein said lubricant (L) further comprising at least one of a friction modifier  
20 (C), a metal detergent (D), and a phosphorus-based anti-wear agent (E).

3. The system according to claim 2, wherein said friction modifier (C) comprises at least one of C1-C40 esters, amines, amides, alcohols, ethers, carboxylic acids, ketones,  
25 aldehydes, and carbonates.

4. The system according to claim 2, wherein said friction modifier (C) comprises at least one of an oxygen-containing organic compound and aliphatic amines.
- 5 5. The system according to claim 1, wherein said lubricant base oil (A) has a sulfur content of not higher than 0.005 mass%, or substantially no sulfur content.
6. The system according to claim 1, wherein said DLC contact  
10 surfaces are contact surfaces provided in an internal combustion engine.
7. The system according to claim 1, further comprising, in addition to said DLC contact surfaces, a pair of  
15 relatively movable, facing non-DLC contact surfaces having no DLC film, wherein said lubricant (L) is interposed both between said DLC contact surfaces and between said non-DLC contact surfaces.
- 20 8. A method of lubricating a system of claim 1, comprising lubricating a pair of relatively movable, facing DLC contact surfaces at least one of which is coated with a DLC film, with a lubricant (L) interposed between said DLC contact surfaces, comprising a lubricant base oil (A) containing  
25 a below-mentioned base oil (X) as main component, and a sulfur-containing molybdenum complex (B).

Said base oil (X) consists at least one of a hydrocracked

mineral oil, a wax-isomerized mineral oil, and a poly- $\alpha$ -olefin base oil, and has a kinematic viscosity of 2 to 20 mm<sup>2</sup>/s at 100 °C, a total aromatic content of not higher than 5 mass%, and a total sulfur content of not higher than 0.005 mass%.

9. A lubricant for lubricating a system having a pair of relatively movable, facing DLC contact surfaces at least one of which is coated with a DLC film, said lubricant comprising:

a lubricant base oil (A) comprising a base oil (X) as a main component, wherein said base oil (X) consists at least one of a hydrocracked mineral oil, a wax-isomerized mineral oil, and a poly- $\alpha$ -olefin base oil, and has a kinematic viscosity of 2 to 20 mm<sup>2</sup>/s at 100 °C, a total aromatic content of not higher than 5 mass%, and a total sulfur content of not higher than 0.005 mass%; and

a sulfur-containing molybdenum complex (B).

10. The lubricant according to claim 9, further comprising at least one of a friction modifier (C), a metal detergent (D), and a phosphorus-based anti-wear agent (E).

11. The lubricant according to claim 10, wherein said friction modifier (C) comprises at least one of C1-C40 esters, amines, amides, alcohols, ethers, carboxylic acids, ketones, aldehydes, and carbonates.

12. The lubricant according to claim 10, wherein said friction modifier (C) comprises at least one of an oxygen-containing organic compound and aliphatic amines.

5

13. The lubricant according to claim 9, wherein a content of said sulfur-containing molybdenum complex (B) is 0.02 to 0.1 mass% of a total amount of the lubricant in terms of molybdenum element.

10

14. The lubricant according to claim 10, wherein said metal detergent (D) comprises a sulfur-free metal detergent as a main component.

15

15. The lubricant according to claim 14, wherein said sulfur-free metal detergent comprises at least one of a neutral alkaline earth metal salicylate and a basic or overbased metal detergent containing calcium borate.

20

16. The lubricant according to claim 10, wherein said phosphorus-based anti-wear agent (E) comprises zinc dithiophosphate.

25

17. The lubricant according to claim 10, wherein said phosphorus-based anti-wear agent (E) comprises a sulfur-free phosphorus compound.